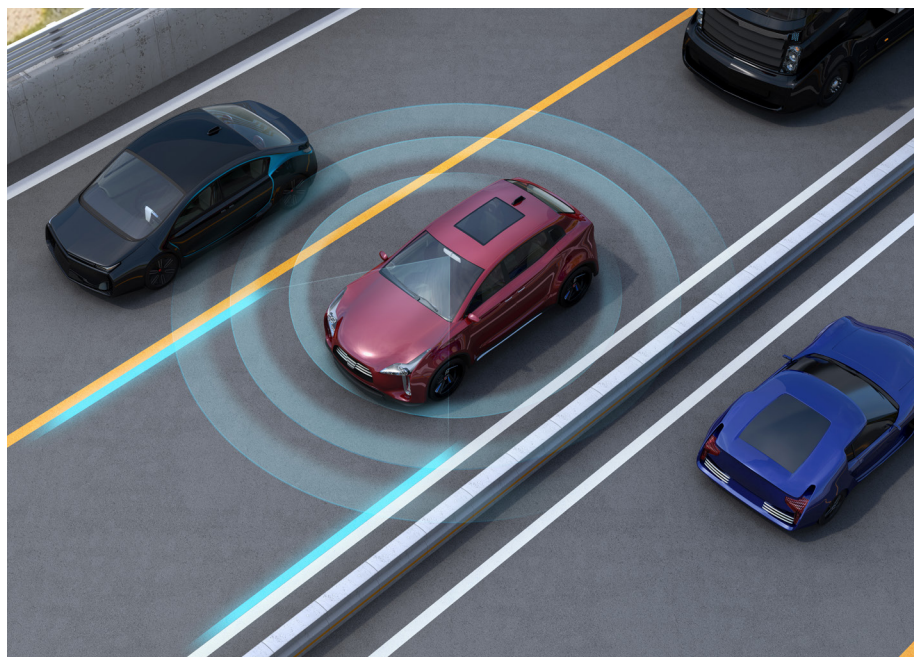


# ADAS SYSTEMS

## Lateral-Collision Avoidance Technologies and Their Growth Potential

By Mike Imlay



■ The standardization of lateral-collision avoidance systems can cut fatal accidents by as much as 25%, and the aftermarket is uniquely positioned to help bring that performance safety to millions of vehicles.

**A**lthough the U.S. aftermarket for advanced driver assistance systems (ADAS) and connected vehicle technologies (CVT) is still in its infancy, SEMA research indicates it can be expected to grow into a \$1.5 billion industry within the next five years. With so much at stake in these rapidly emerging technologies, SEMA has made identifying ADAS/CVT opportunities for association members a key priority.

In this fifth installment of an eight-part SEMA News series highlighting key findings in the “SEMA Advanced Vehicle Technology Report,” we take a look at lateral-collision avoidance technologies, along with the aftermarket trends surrounding them. An interview with SEMA Vice President of Technology John Waraniak further explaining lateral-collision technologies and their implications for the aftermarket can be found on p. 88. Readers are also

encouraged to download the full report at [www.sema.org/avt-opportunities](http://www.sema.org/avt-opportunities).

### Systems and Acronyms

Lateral-collision avoidance systems monitor a vehicle’s position within a lane. Divided into two categories, “passive” and “active,” they can warn the driver of an inadvertent lane departure or an impending collision or, in more complex applica-

tions, actually correct the vehicle’s position in the lane to avoid an accident. (See chart: “Lane-Departure Warning/Lane-Keep-Assist Systems.”)

These systems are able to decrease accidents that usually result from driver distraction, drowsiness during long trips, or other errors. In fact, they have shown tremendous effectiveness in cutting down sideswipe collisions. Consequently, their use has increased since automakers began introducing them as equipment options in 2011. (See chart: “System Adoption Rate by Vehicle Year.”) Ranging from lower to higher complexity, they include:

- **Blind-spot warning (BSW):** Typically, these passive applications provide a warning light when another vehicle is in a driver’s blind spot. Some systems add an audible or haptic warning if the vehicle begins to enter an adjacent lane where another vehicle occupies the blind spot.
- **Lane-departure warning (LDW):** These passive applications use vehicle-mounted sensors (usually cameras) to identify lane lines. They monitor a vehicle’s position in a lane and warn the driver if he or she approaches the lane boundaries.
- **Lane-keeping assistance (LKA):** An extension of LDW, these active systems can slightly apply braking to “nudge” a drifting vehicle back into its lane. These systems combine one or more cameras, an electronic control unit, and integration with the brake control system.
- **Lane centering:** Exhibiting the highest level of functionality, these active systems stay continually engaged with

the steering system once triggered. They primarily utilize cameras to detect lane lines, but some are also able to monitor a lead vehicle to help determine the proper driving path.

While these systems have been an overall positive step toward safety performance, some consumers continue to deem them unnecessary. In fact, one barrier to wider adoption is the tendency for systems to generate warnings even when vehicles drift only slightly within their lanes. Frequent alerts from passive systems, especially, can become a nuisance. In addition, active systems require heavy integration into multiple vehicle control systems and electronics—another barrier for the aftermarket. On the other hand, passive systems require little integration, making them ideal for the aftermarket.

## Market Profiles

Estimates indicate that LDW systems can reduce overall accidents by 3%, injury-causing accidents by roughly 6%, and fatal accidents by approximately 25%. The most typical accidents associated with lane departure are head-on crashes, which LDW is estimated to have the ability to cut by 45%–50%.

At the OEM level, LDW systems are now available on many '11 and later models. In comparison, lane-keeping assistance is much less common, as National Highway Traffic Safety Administration specifications for system requirements are still pending. Meanwhile, blind-spot monitoring is now widely used on standard trim packages.

In the aftermarket, active lateral-collision avoidance systems are less prevalent than other ADAS technologies, while passive systems are increasing in their percentage of the market. Initial consumer feedback indicates that BSW is one of the more attractive systems for retrofitting. These systems do not need much integration into existing vehicle systems and therefore have higher aftermarket potential.

Several aftermarket companies also now offer LDW systems—and have for a number of years. However, they are yet to prove as popular with consumers as BSW. In terms of the entire lateral-collision category, a selling point for the aftermarket is its ability to offer a wide variety of system

types at varying costs compared to OEMs, ranging from sensors to blinker-activated camera imaging. (See chart: “Aftermarket Product Adoption Likelihood.”)

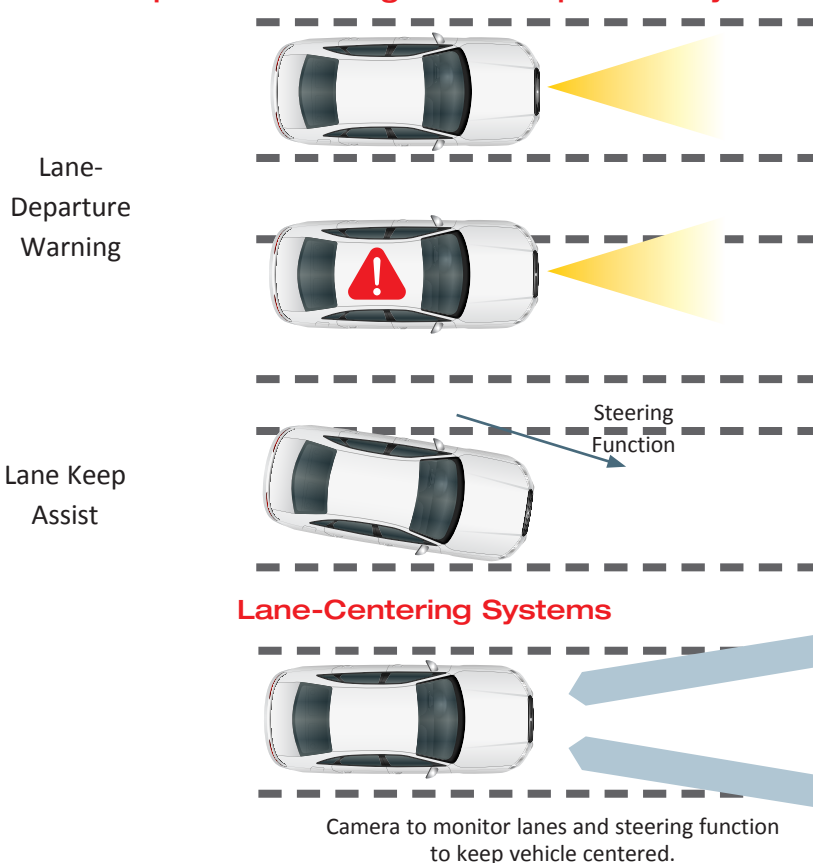
## LDW Systems

The aftermarket supplier landscape for

LDW systems is highly comparable to forward-collision warning (FCW) systems due to similarity in technologies and the ability to offer both types of systems in a single product. However, LDW is more often camera-based, while FCW is usually radar-based.

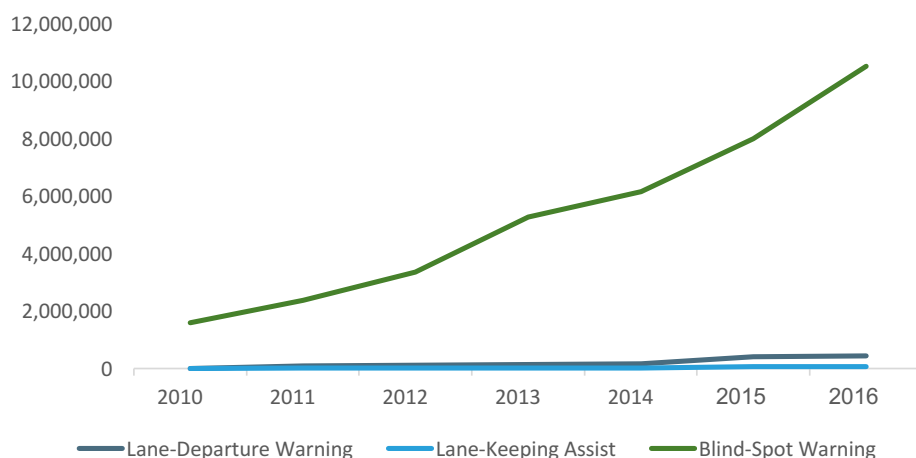
So far, the market leaders have been

### Lane-Departure Warning/Lane-Keep-Assist Systems



■ This is an illustration of LDW versus lane-keeping and lane-centering technologies. LDW is a passive system that exhibits very little complexity for the aftermarket.

### System Adoption Rate by Vehicle Year



Source: NHTSA, AAA, Ducker Analysis

■ While OEMs have worked since 2011 to standardize lateral-collision avoidance technologies on newer models, there is still a large aftermarket for retrofitting LDW and BSW systems on millions of vehicles dating back to 2010.

early-entrant specialty product manufacturers, while infotainment and mobile electronics manufacturers make up the bulk of secondary market participants. Normally these secondary participants include the makers of other camera-based ADAS products (i.e., passive parking assistance).

The market demand for camera-based LDW solutions is forecasted to increase, especially as they become more functional and pricing falls. In fact, end-user adoption is expected to climb by 25%–50% over the next four years, offsetting any declines the aftermarket might otherwise see as OEMs roll out LDW-equipped vehicles to meet their 95% standardization goal by 2022. (See chart: “Potential Aftermarket Passive LDW System Sales.”)

### BSW Systems

Consumer demand is currently strong for aftermarket BSW solutions, and the category is expected to see continued steady growth through 2021. In fact, due to their ease of interactivity, the adoption rate for BSW systems is high relative to other ADAS products. (See chart: “Potential Aftermarket Passive BSW Systems Sales.”)

The systems currently found in the market are extremely functional, and market participants have indicated a high degree of satisfaction with them. However, the reviews vary by vehicle type, since some models lacking OE BSW systems leave limited mirror space for the typical warning indicators. Moreover, installations can often require complex mirror work and system calibration, adding to total package costs, which can average \$200–\$400.

Among specialty-equipment manufacturers, BSW devices currently have fewer aftermarket participants relative to other ADAS products due to the high number of sensors and indicators required. Still, strong demand for these products will offer fresh opportunities for potential new-entry participants. That said, there are two barriers to entry: First, installations of lateral-collision avoidance systems generally take place at dealerships, where many aftermarket participants may lack sales and distribution setups. Second, larger ADAS participants are able to leverage capabilities from related products to supply the

market. So, as with LDW systems, BSW market leaders are currently early-entrant specialty-equipment manufacturers. Infotainment, navigation and mobile electronics manufacturers typically make up the market’s secondary participants.

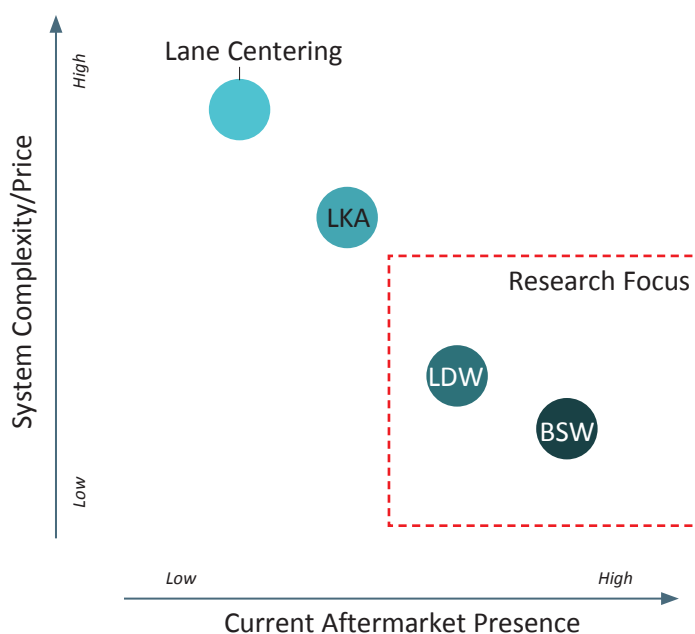
### The Bottom Line

Putting it all together, there are a variety of lateral-collision avoidance systems available to consumers, both from OEMs and the aftermarket. These systems typically use cameras and/or radar to help drivers stay in their lanes, “see” vehicles in their blind

spots, and dramatically cut the chances of sideswipe and head-on collisions.

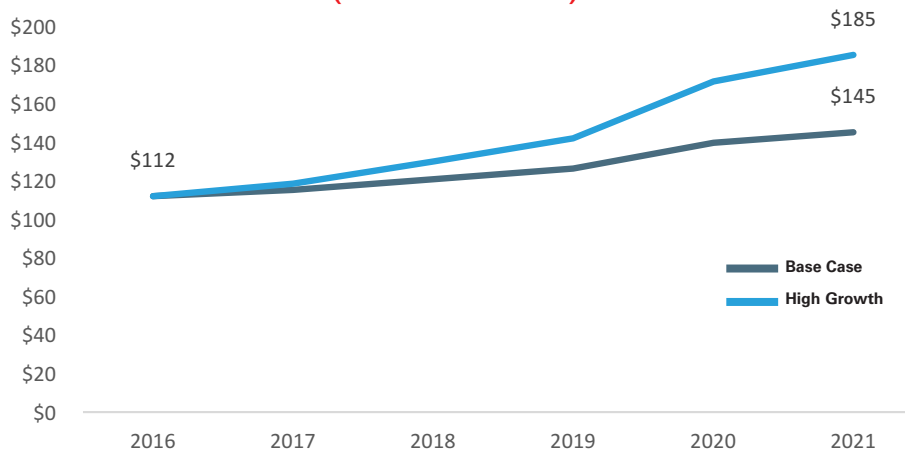
Due to their lesser complexities and relative ease of installation, “passive” LDW and BSW systems currently hold the most promise for the aftermarket. As OEMs rush to standardize these technologies on all new models by 2022, demand for aftermarket solutions for earlier, unequipped vehicles in operation is expected to grow significantly. What’s more, the relative simplicity, low cost and nuisance-free operation of LDW and BSW products in the world of ADAS are already making them consumer favorites.

### Aftermarket Product Adoption Likelihood



■ Active lane-centering and lane-keeping systems are expected to remain specialties of OEMs, leaving passive LDW and BSW in the domain of the aftermarket.

### Potential Aftermarket Passive LDW Systems Sales (millions of USD)



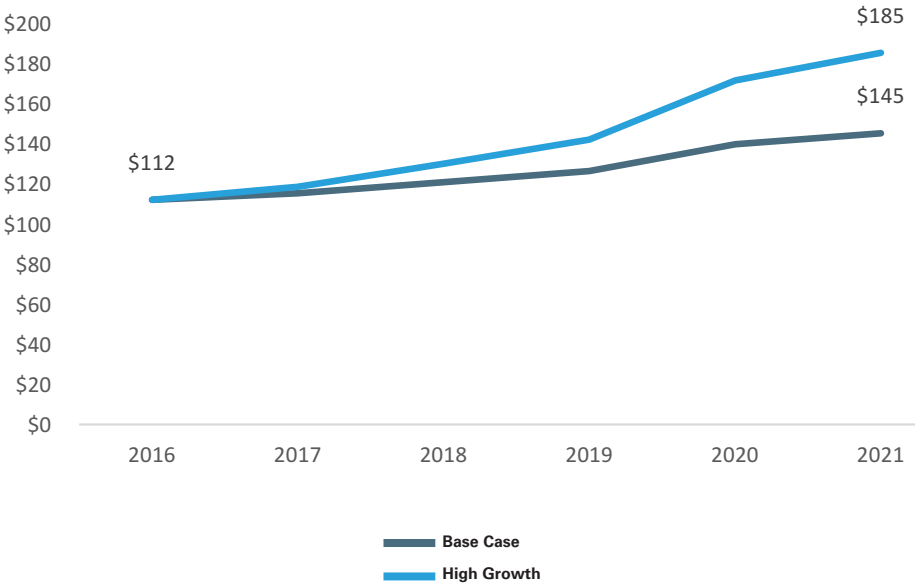
■ Although sales of aftermarket LDW solutions won’t likely show a sharp increase over the next few years, the total dollar value of those sales still makes them lucrative products.

While a few large market leaders presently dominate the supply side, there is yet room for new entrants. On the retail end, jobbers and installers should especially consider offering these two potentially profitable “performance safety” options to their customers. Whatever place your business occupies within the aftermarket, now is the time to embrace the ADAS evolution.

Stay Informed!

The tremendous potential ahead for the specialty-equipment industry is detailed in the “SEMA Advanced Vehicle Technology Opportunities Report.” To download your copy, go to [www.sema.org/avt-opportunities](http://www.sema.org/avt-opportunities).  
For additional information about ADAS technologies and how they may impact your business, visit the SEMA Garage vehicle technology web-page at [www.semagarage.com/services/vehicletechnology](http://www.semagarage.com/services/vehicletechnology). 📄

Potential Aftermarket Passive BSW Systems Sales (millions of USD)



■ Even as OEMs standardize ADAS systems by 2022, the aftermarket can expect a steady and profitable climb in the BSW solutions it can offer consumers.